

## REMARKS

This is in response to the Office Action mailed June 9, 2005. In view of the following comments, the Examiner's reconsideration is respectfully requested.

Claims 11-19, 21-22 and 25-30 are currently pending in the present application. A clean copy of the pending claims is presented for the Examiner's convenience.

On pages 5-10 of the Office Action, claims 11-19, 21, 22 and 25-30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kittilsen et al. (USPN 5,915,455) in view of Foye (USPN 3,556,197) and further in view of Tarmann et al. (USPN 2,690,600).

The above rejections are respectfully traversed for the following reasons.

**Kittilsen** discloses a horizontal casting apparatus provided with a mold including a primary water-cooling circuit 11 and a secondary water-cooling circuit 12. In the primary water-cooling circuit 11, water passes through the mold without directly contacting the magnesium. The water from the secondary water-cooling circuit 12 is sprayed through slots or nozzles 18 directly onto the magnesium hitting the metal at angle of about 30-35°.

The Kittilsen mold also includes an oil ring 19 having channels 20 for supplying oil to lubricant the mold. Reference numeral 21 denotes a transition ring formed of insulating porous refractory material positioned at the inlet of the mold through which a protective gas is supplied from channels or gas supply passages 22. The molten metal solidifies at the point denoted by reference numeral 25. The protective gases are supplied to the molten metal prior to solidification in order to prevent discoloration. As previously discussed, the gas does not provide any lubricating effect in the mold. Note that the oil is supplied at solidification point 25 for the purpose of lubricating the mold.

For the reasons set forth in the previous response, it is submitted that the teachings of Kittilsen and Foye would not result in an apparatus in which oil and gas are employed as lubricants.

In the rejection, the Examiner acknowledges the Kittilsen does not disclose the restricting elements between the permeable wall and an interior wall of the mold housing as required in claims 11 and 17. In particular, claim 11 requires, *inter alia*, annuli formed between said permeable wall material and said mold housing to distribute the oil and/or gas to the permeable wall material. Claim 11 further specifies that each of said annuli is divided into a plurality of sectors by restriction members, and each of the sectors is supplied with oil and/or gas via separate supply channels, thereby permitting differentiation of the oil and/or gas around the circumference of the mold.

In an attempt to cure the deficiencies of the Kittilsen reference, the Examiner applies Foye to teach the “concept” of the differentiating the supply of oil around the circumstance of a mold cavity. As with the Kittilsen reference, the Examiner acknowledges that Foye does not disclose the required plurality of plugs or restriction members forming sectors to permit differentiation of the supply of oil and/or gas around the circumstance of the mold. In view of the recognition that the Kittilsen/Foye combination does not disclose or suggest the claimed restriction members, the Examiner applies Tarmann to modify the Foye reference by adding restricting elements between the permeable wall and an interior wall of the mold housing to differentiate the supply of oil and/or gas around the circumstance of the mold cavity.

Initially, it is noted that claim 11 recited that the restricting elements divide each of the annuli into a plurality of sectors. Where are the annuli formed between the permeable wall material and the mold housing in the Kittilsen/Foye combination?

On page 3 of the Office Action, the Examiner describes the Tarmann reference as *“a device for introducing a lubricant into a mold for continuous casting of metals, including iron and steel, in which the device includes a ring groove 2 that includes inserted pieces 3 (plugs/restrictions) for subdividing the ring groove into sections 4 (segments), such that the supply of lubricant can be “differentiated” around sections 4 of the groove 2 via lubricant admission channels 5, for the purpose of independently providing lubricant uniformly into the ring groove segments 4 (column 1, lines 1-55; column 2, lines 1-21; and Figures 1 and 2).”*

However, it is submitted that the Examiner's characterization of the Tarmann reference is incorrect.

**Tarmann**, in column 1, lines 54-55 and column 2, lines 1-3 states that:

*“The ring groove 6 is closed up, for example by a screwed-on cover 7, which leaves a narrow slot 8 open for the discharge of the lubricant along the ring groove segments.”*

In other words, the intended purpose of the Tarmann device is to “uniformly” distribute lubricant on the inner surface of the mold (see col. 1, lines 13-15; patent claim 4). This purpose is achieved by the slot 8, which communicates with all of the segments around the periphery of the mold. Furthermore, in the Tarmann device, even if oil is supplied in different amounts to each segment, the oil is evenly distributed along the slot since the slot 8 communicates with each of the segments. In contrast, in the present

invention, there is no such slot since the oil and gas are each supplied through the permeable wall material. It is further noted that Tarmann does not disclose supplying gas but only oil.

In view of the fact that Tarmann device uniformly discharges the oil through the slot 8, it clearly would not have been obvious to distribute both oil and gas unevenly (differentiated supply) through a permeable wall material. Accordingly, it is submitted that the Examiner's proposed modification of the proposed Kittlesen/Foye combination, clearly does not result in the claimed invention as defined in claims 11 and 17.

Further, on pages 8-10 of the Office Action, the Examiner rejects claims 11-19, 21, 22 and 25-30 under 35 U.S.C. § 103(a) as being unpatentable over Naess, Jr. et al. (EP 0 337 769) in view of Foye and further in view of the newly applied Tarmann reference.

The Naess patent discloses a "vertical" casting mold having a vertical inlet 2, an inwardly protruding middle 3, a lower mold cavity 4, and a vertically movable support 5 that seals off the outlet of the mold (see column 3, lines 47-52). A permeable ring 20 is provided between a projection 15 (of sleeve 12) and a hot-top 10. The permeable ring (at 23) forms an upper side wall of the "lower" mold cavity 4, and end 16 of the projection 15 forms a lower side wall of the mold cavity (i.e. adjacent the mold outlet). Initially, it is submitted that the Examiner's characterization of the Naess apparatus as a horizontal continuous casing apparatus is clearly incorrect. Note that the Naess reference is directed to vertical casting in which differentiated distribution of the lubricant is not required. In the present invention, gas and/or oil can be supplied in different quantities to different sections,

i.e. differentiated distribution. Clearly any application of the Tarmann reference in which a uniform supply of oil is supplied through a slot, would not result in the claimed invention.

In view of the above, it is submitted that the collective teachings of Naess and Foye, and further modified by Tarmann, would not result in the claimed invention as defined in claims 11 and 17, and thus claims 11 and 17 are clearly allowable over the applied prior art references.

Further, It is noted that, on pages 2-4 of the Office Action, claims 11, 17 and 25-30 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 9, 11, 12, 14, 16 and 17 of co-pending application No. 10/009,690 in view of Foye and further in view of Tarmann.

For the reasons advanced above, it is submitted that the claims in the present application are clearly not obvious variations of the invention defined in the claims of the co-pending application. This is particularly evidenced by the fact that the Examiner has modified a "modifying" reference in order to provide the features which are not recited in the claims of the co-pending application. Accordingly, it is submitted that the present claims are not merely obvious variations of the claims in the co-pending application for the reasons advanced above in the discussion of the prior art rejections that have applied the Foye and Tarmann references.


In view of the above, it is submitted that the present application is now clearly in condition for allowance. The Examiner therefore is requested to pass this case to issue.

In the event that the Examiner has any comments or suggestions of a nature necessary to place this case in condition for allowance, then the Examiner is requested to

contact Applicant's undersigned attorney by telephone to promptly resolve any remaining matters.

Respectfully submitted,

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